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REMARKS

The application has been reviewed in light of the Office Action dated May 22, 2006. Claims 1-54 were pending, with 11-30, 35-42 and 47-54 having been withdrawn by the Patent Office from examination. By this Amendment, new claim 55 has been added. Accordingly, claims 1-10, 31-34, 43-46 and 55 are presented for reconsideration, with claims 1, 31 and 43 being in independent form.

Claims 1-10, 31-34 and 43-46 were rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over U.S. Patent No. 6,338,545 (Sekiya '545).

Applicant has carefully considered the Examiner's comments and the cited art, and respectfully submits that independent claims 1, 31 and 43 are patentable over the cited art, for at least the following reasons.

This application relates to improvements to inkjet recording which enable recording of desirable round dots of ink. Applicant found through extensive investigation and testing that satisfactory round dots of ink can be obtained by maintaining an optimum relation between ink and paper so that the contact angle of ink stops changing after a predetermined time, and more specifically that it is desirable to employ a nozzle element configured such that when the nozzle element ejects the recording liquid onto the recording medium, a contact angle of the recording liquid stops changing when 100 ms or less elapses after the recording liquid contacts the recording medium. Each of independent claims 1, 31 and 43 addresses these features, as well as additional features.

Fig. 7 of this application shows an example of measuring the changes of contact angle where the ink (for example, recording liquid of claim 43) is applied to various kinds of paper. This example demonstrates that satisfactory round dots of ink can be obtained in a case where the ink has a characteristic of exhibiting a contact angle that stops changing substantially after 100ms

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(for example, with respect to papers C, D, E, and F in Fig. 7), and that satisfactory round dots of ink are not obtained in a case where the ink has a characteristic of exhibiting a contact angle that continues changing even after 100 ms (for example, with respect to papers A and B).

Sekiya '545 proposes an approach for inkjet recording utilizing an ink jet recording apparatus having an orifice which has a diameter less than 25  $\mu\text{m}$ , coupled with a fine particle dispersion recording composition. Such an approach can yield a high-quality and high-resolution image having high water and light resistances.

As acknowledged in the Office Action, Sekiya '545 does not disclose or suggest, however, use of a nozzle element configured such that when the nozzle element ejects the recording liquid onto the recording medium, a contact angle of the recording liquid stops changing when 100 ms or less elapses after the recording liquid contacts the recording medium, as provided by the subject matter of claim 1.

Contrary to the contention in the Office Action, it would not have been obvious to perform experimentation to determine the range of time periods after which a contact angle of the recording liquid should stop changing. Sekiya '545 simply does not disclose or suggest that such an aspect is an issue for generating satisfactory round dots of ink.

Sekiya '545, column 6, lines 54-57, states that "special efforts have been directed toward optimizing a hardness of materials which constitute a nozzle component, and ink flow and pigment diameter against nozzle size". Sekiya '545 also refers to various experiments performed using nozzles of various materials, nozzles having various orifice sizes, and ink of various materials (Sekiya '545, Tables 1-13). However, Sekiya '545 is not concerned with obtaining satisfactory round dots of ink by attaining an optimum relation between ink and paper so that the contact angle of ink stops changing after a predetermined time.

Further, Sekiya '545 does not provide motivation for experimenting with the changes in

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the behavior of contact angle of a recording liquid with respect to the type of paper. In other words, one skilled in the art is not motivated to experiment with the changes in the behavior of contact angle of a recording liquid with respect to the type of paper based on merely the cited art.

For at least the reasons stated above, claim 1 of the present application is patentable over the cited art. Independent claims 31 and 43 are patentably distinct from the cited art for at least similar reasons. In addition, Applicant respectfully submits that withheld claims 11-30, 35-42 and 47-54 likewise are allowable.

In view of the amendments to the claims and remarks hereinabove, Applicant submits that the application is now in condition for allowance. Accordingly, Applicant earnestly solicits the allowance of the application.

If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition. The Patent Office is hereby authorized to charge any fees that may be required in connection with this amendment and to credit any overpayment to our Deposit Account No. 03-3125.

If a telephone interview could advance the prosecution of this application, the Examiner is respectfully requested to call the undersigned attorney.

Respectfully submitted,

  
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